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FUNCTIONAL ANALYSIS AND TREATMENT OF ESCAPE-MAINTAINED AGGRESSION CORRELATED WITH SLEEP DEPRIVATION

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Functional analysis identified the consequences that maintained aggressive behavior and the relationship between those consequences and sleep deprivation for an individual with severe mental retardation. Results showed that aggression was maintained by negative reinforcement contingencies (escape from demand) and that aggression was more severe when sleep deprivation was present. A multicomponent intervention resulted in reductions of aggression for up to 7 months.

DESCRIPTORS: functional analysis, sleep deprivation, aggression, establishing operations

Research on functional analysis has yielded a number of strategies that can be used to identify the contingencies that maintain severe behavior disorders (e.g., Iwata, Dorsey, Slifer, Bauman, & Richman, 1982). These techniques emphasize temporally proximate conditions (immediate antecedents and consequences identified during the analysis) when determining the function of problem behavior. There is now a need to examine how the methods of functional analysis might be adapted to include an assessment of other variables, such as establishing operations (Michael, 1982), that may be temporally distant but can alter the probability of responding.

Limited research has demonstrated a relationship between sleep deprivation and challenging behavior (e.g., Horner, Vaughn, Day, & Ard, in press) but has not examined the relationship between lack of sleep and temporally immediate contingencies that maintain problem behaviors. In this study, sleep deprivation was operationally defined and its natural variation was measured across all functional analysis assessments. A descriptive analysis of the influence of sleep deprivation on temporally proximate stimulus–response relations during each functional analysis condition was therefore possible.

METHOD: *Participant, settings, and target behaviors.* Shawn, a 31-year-old man with a diagnosis of severe mental retardation, participated in the study. He used one- to two-word utterances to communicate and could follow one- and two-step directions. Assessments and interventions were conducted at Shawn's vocational facility and his home. He resided at home with his father and sister and attended the vocational facility 5 days each week. Shawn's aggressive behavior included hitting, pinching, slapping, and scratching. He experienced sleep deprivation frequently, defined as less than 5 hr of sleep in a given night. On these nights, Shawn entered the kitchen between 2:00 a.m. and 3:00 a.m. and remained seated there until 7:00 a.m. Sleep deprivation was recorded independently by his sister and father each night, with 100% agreement on its occurrence throughout the study. Structured interviews with family and staff and systematic observation over a 3-week period yielded three hypotheses regarding the occurrence of Shawn's aggression: (a) positive reinforcement by social attention, (b) negative reinforcement by escape from demands, and (c) sleep deprivation resulted in increases in aggression. (Complete definitions of target behaviors and functional assessment protocol are available from the author.)

Functional analysis. Two conditions were presented to test the reinforcement hypotheses, while naturally occurring sleep deprivation was measured across these conditions. Aggression was recorded during 20-min sessions using a 10-s partial-interval procedure. Mean agreement on occurrence of aggression, assessed during 40% of the sessions, was 92%.

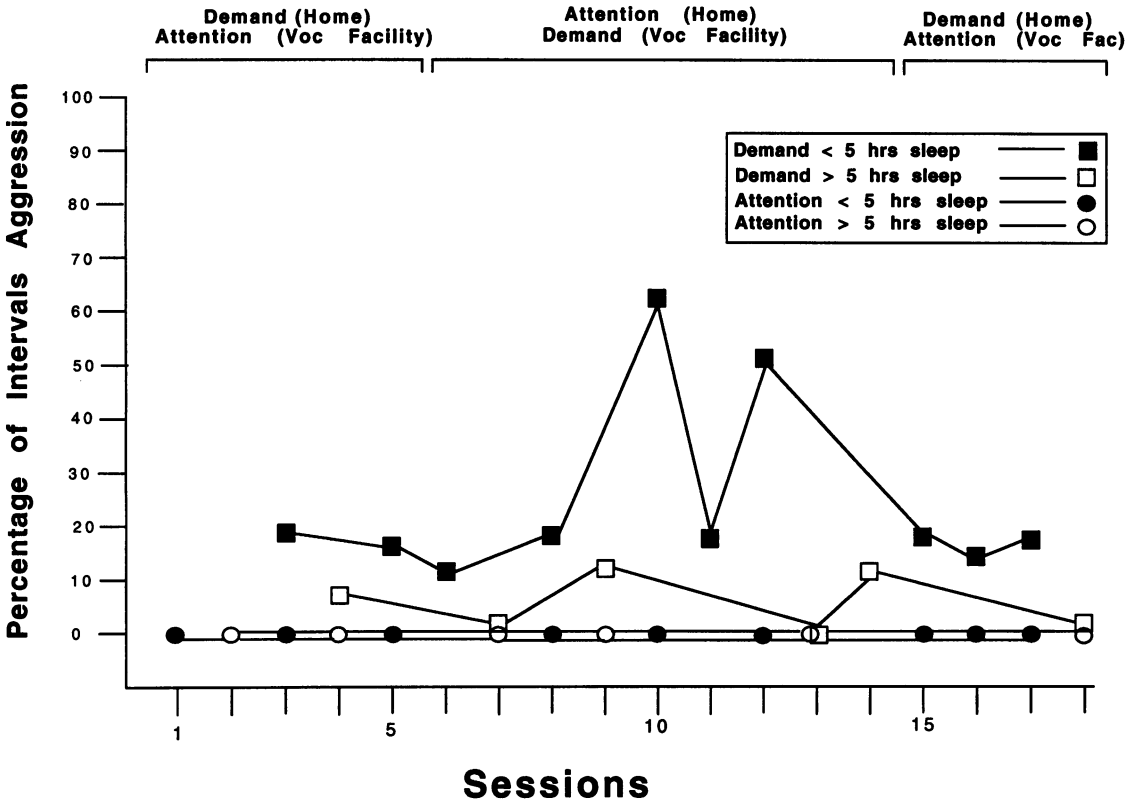
During the attention condition, Shawn was present in a room with the therapist. Materials such as magazines were available, but no particular tasks were provided. The therapist remained approximately 3 m from Shawn and provided verbal reprimands for approximately 10 s contingent on the occurrence of aggression. During the demand condition, two tasks that Shawn had difficulty completing were selected from the home and vocational facility. Both tasks were presented during each session in the facility and at home. The therapist spent an equal amount of time on each task during a session and tasks were alternated across sessions, so that 50% of the sessions were initiated with each task. Instruction was discontinued for a minimum of 10 s when aggression occurred and was immediately reinstated following this delay or when aggression stopped.

The functional analysis was conducted in the vocational facility and at home, with attention and demand conditions counterbalanced across settings and reversed across settings (see the figure). A maximum of two sessions were conducted each day to assess the effects of sleep deprivation on aggression during the attention and demand conditions.

Intervention. A multicomponent behavior support plan that included rest periods, offering choices, pretask requests, functional communication training, and backward chaining was developed based on the results of the functional analysis. (A detailed description of the intervention and design is available from the author.)

RESULTS AND DISCUSSION: Results of the functional analysis demonstrated that Shawn exhibited aggression in the facility and at home during demand conditions only (see the figure). Sleep deprivation during the demand condition resulted in a higher percentage of intervals of aggression (M = 25%; range, 12% to 64%) compared to demand conditions when Shawn had slept more than 5 hr the night before (M = 6%; range, 0% to 14%).

Baseline assessment in the facility and at home yielded means of 20% (range, 5% to 58%) and 23% (range, 3% to 47%) of intervals of aggression, respectively. When all components of the support plan were implemented, the percentage intervals of aggressive behavior decreased substantially in the facility (M = 1.5%; range, 0% to 7%) and in the home (M = .8%; range, 0% to 6%). Follow-up probes for up to 7 months indicated maintenance of the treatment effects. This study demonstrated a conditional functional



relation between sleep deprivation and escape-maintained aggression. Although the generality of these findings is unknown, this study extends the use of functional analysis to an examination of variables that can affect temporally proximate response–reinforcer relations.

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